REMARKS

In the Office Action, the Examiner reviewed claims 1-20 of the above-identified US Patent Application, with the result that all of the claims were rejected under 35 USC §103. In response, Applicants have amended the specification and claims as set forth above. More particularly:

The specification has been amended to correct a typographical error.

Independent claim 1 has been amended to recite that, similar to independent claim 15, the step of forming the aluminized surface entails heating the material and the component.

Independent claims 1 and 15 have been amended to specify that some of the metallic particles sinter during heating to form the aluminized surface, the result being the adherent/oxidized particles that are sintered to the aluminized surface. Support for these amendments can be found in Applicants' specification at paragraph [0009].

Applicants believe that the above amendments do not present new matter. Favorable reconsideration and allowance of claims 1-20 are respectfully requested in view of the above amendments and the following remarks.

Rejections under 35 USC §103

Independent claims 1 and 15 and their dependent claims 2-14 and 16-20 were rejected under 35 USC §103(a) on the following grounds:

Claims 1-10 and 14-20 were rejected as being unpatentable over Applicants' admitted prior art (APA) in view of U.S. Patent No. 6,475,289 to Schilbe et al. (Schilbe) or U.S. Patent No. 6,265,022 to Fernihough et al. (Fernihough).

Claims 11-13 were rejected as being unpatentable over the APA in view of Schilbe or Fernihough, and in further view of U.S. Patent No. 5,707,453 to Sherman et al. (Sherman).

Claims 1-11 and 13-20 were rejected as being unpatentable over the APA in view of U.S. Patent Application Publication No. 2005/0035086 to Chen et al. (Chen).

Claim 12 was rejected as being unpatentable over the APA in view of Chen in further view of Sherman.

Applicants respectfully request reconsideration of these rejections in view of the following comments.

Applicants' invention is directed to a process for removing particles that become adherently sintered to an aluminized surface during an aluminiding process, such as performed on the internal cooling passages of a gas turbine engine component.

Applicants' claimed method is particularly directed to the removal of adherent oxidized particles that form as a result of oxidation of a metallic powder used as an aluminum source during slurry aluminiding processes, which at the elevated temperature of the aluminizing process become attached by sintering to the aluminized surface. According to the invention, the oxidized particles sintered to the aluminized surface are removed with an aqueous caustic hydroxide solution.

As noted at paragraph [0008], the sintered particles of concern to Applicants are distinguishable from dirt and other contaminants that tend to collect within cooling passages of gas turbine engine components (e.g., oxides and compounds identified by Schilbe at column 3, lines 7-13).

Under each of the §103 rejections, the Examiner explained that the APA discloses Applicants' claimed process except "contacting the aluminized surface with an aqueous caustic hydroxide solution until the adherent particles are removed from the surface." The Examiner then cited Schilbe, Fernihough, and Chen as follows:

> Schilbe et al. teach that a suitable caustic compound for removal of oxidized particles from the internal cavities of turbine components is an aqueous hydroxide solution (balance water) such as potassium hydroxide (KOH). (See Col. 3, Lines 37-44). . . .
>
> It would have been obvious to one of ordinary skill in the art at the time of invention to use the caustics (KOH) well known in the art for removal of adherent oxides from the internal surfaces of turbine components.

Office Action at page 3.

> Fernihough et al. teaches that (KOH) is suitable caustic compound for removal of ceramic or metallic particles from internal surfaces of a turbine component after an aluminizing process. (Col. 6, Lines 28-30).
>
> It would have been obvious to one of ordinary skill in the art at the time of invention to use (KOH) after an aluminizing process in order to remove residual metal oxides (ceramic) from the internal surfaces of turbine components.
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> Office Action at page 3.

> Chen et al. teaches using a KOH solution having a temperature of 60-100°C a concentration of 10-50% and a cleaning time of 20 min to 4 hours, (Paragraphs 37-38) and using ultrasonic agitation. (Paragraphs 39 and 34). . . .
>
> It would have been obvious to one of ordinary skill in the art at the time of invention to use the caustic solution of Chen et al. since Chen et al. teaches that the solution is well suited for removal of metal oxides and the like from the internal surfaces of turbine components.
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> Office Action at page 5.

As noted above, Applicants teach and claim a process to remove metal particles of an aluminum source (i.e., aluminum-containing particles) that, during the formation of an aluminized surface, oxidize and sinter to the aluminized surface. Therefore, the chemical reaction that attaches the oxidized aluminum-containing particles to a surface during aluminization of that surface is distinguishable from debris that simply collects on an existing surface, such as an existing aluminized surface, under other conditions, such as during

engine operation. For example, debris that collects during engine operation general does not oxide *in situ* while in contact with the surface, but instead is already oxidized as a result of traveling in the hot gas path of the engine. Furthermore, during aluminization an aluminide coating is being deposited on the same surface that oxidized metallic particles are sintering to. In contrast, no aluminide coating occurs during engine operation that could affect adhesion of the debris that collects on a surface.

Schilbe is concerned with removing "accumulated oxides and dirt from the internal passage" of "an engine-run gas turbine engine airfoil." Therefore, the oxides and dirt removed by Schilbe's process are not adhered to Schilbe's internal passage in the same manner as the aluminum-containing particles oxidized and sintered *in situ* during an aluminiding process of a surface to which the particles adhere and are then removed according to Applicants' claimed process.

Fernihough is concerned with removing from a cooling hole 4 a plug material 6b formed by partially sintering ceramic or metallic particles. While the plug material 6b is within the cooling hole 4 before a coating process is performed, the resulting coating 9 is not deposited on the surface of the hole 4 contacted by the plug material 6b (see Figure 3g). Therefore, the sintered ceramic or metallic particles removed by Fernihough are not adhered to

Fernihough's cooling hole 4 in the same manner as the aluminum-containing particles oxidized and sintered *in situ* during an aluminiding process of a surface to which the particles adhere and are then removed according to Applicants' claimed process.

Chen is concerned with removing a "degraded coating" with a caustic hydroxide solution (see paragraph [0037]). The meaning of the term "degraded coating" is not entirely clear from Chen. Chen teaches removing "hot corrosion products" from an aluminide coating with an acetic acid solution, grit blasting, etc. (paragraphs [0028]-[0031]). Further processing then appears to address the removal of "residual degraded material" (paragraphs [0032]-[0036]). Finally, Chen discusses the removal of "the degraded coating" with the caustic hydroxide solution. In any event, Chen at best removes the same type of debris removed by Schilbe, which are therefore not adhered in the same manner as the aluminum-containing particles oxidized and sintered *in situ* during an aluminiding process of a surface to which the particles adhere and are then removed according to Applicants' claimed process.

In view of the above, Applicants believe that the three secondary references do not provide any basis for a reasonable expectation of success that adherent oxidized metallic particles formed *in situ* during an aluminiding process of the same surface to which the particles are concurrently sintered

(the APA) could be removed with a caustic hydroxide solution. "The [references] disclose, at most, that one skilled in the art might find it obvious to try the claimed invention. But whether a particular combination might be 'obvious to try' is not a legitimate test of patentability." See MPEP §2145X.B., citing *In re Fine*, 5 USPQ2d 1596, 1599 (Fed. Cir. 1988), citing *In re Geiger*, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Applicants therefore respectfully request withdrawal of the rejections to the claims based on the APA combined with Schilbe, Fernihough, and Chen.

Because Sherman was merely applied for disclosing ultrasonic-assisted treatment, Applicants believe that Sherman cannot be said to supplement the teachings of the APA, Schilbe, Fernihough, and Chen in order to arrive at Applicants' invention. Therefore, Applicants also respectfully request withdrawal of the rejections in which Sherman is applied as a tertiary reference.

Closing

In view of the above, Applicants believe that the claims define patentable novelty over all the references, alone or in combination, of record. It is therefore respectfully requested that this patent application be given favorable reconsideration.

Should the Examiner have any questions with respect to any matter now of record, Applicants' representative may be reached at (219) 462-4999.

Respectfully submitted,

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